

# PATENT SPECIFICATION

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## PROVISIONAL SPECIFICATION.

Improvements relating to means for Releasing Compressed Gas or Gases from Containers thereof.

We, THE WALTER KIDDE COMPANY LIMITED, a British Company, of Lux Works, Belvue Road, Northolt, Middlesex, and ALEXANDER RONALD SPIDY, a British Subject, of 34, Durham Avenue, Heston, Middlesex, do hereby declare the nature of this invention to be as follows:—

This invention relates to means for releasing compressed gas or gases from containers thereof, and has particular reference to improved means for enabling compressed gas to be released into the interior of inflatable life-saving vests and similar buoyant devices with a minimum of effort and a high degree of efficiency and reliability.

According to the present invention a gas releasing equipment ready for use is provided comprising a housing or jacket containing a readily removable compressed gas container, and means within a removable cap portion of said housing or jacket for co-operation with the container whereby a simple manual operation, such as the withdrawal of a pin from the cap causes the release of the compressed gas whereupon the removal of the cap followed by the removal of the discharged container and its replacement by a new one, and the replacement of the cap and the release pin or the like, restores the equipment ready for re-use.

The invention regarded as a device for co-operation with a compressed gas container of any ordinary type having a sealed opening comprises the aforesaid housing or jacket and the aforesaid means in the cap portion thereof, a seal rupturing device, and means whereby the pulling or removing of the said pin or the like is automatically followed by relative movement between the said device and the container in such a way as to cause rupture of the seal.

As applied to an inflatable jacket or other buoyant device the equipment may be mounted in the wall thereof with substantially only the neck of the container and the housing cap projecting outwardly, in which case the base

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or remote end of the housing may be formed with an exit hole for the released gas to pass down from the neck of the container and between its external surface and the jacket and through the said release hole into the inflatable space.

According to one embodiment of the invention the base of the gas container housing carries interiorly a spring or buffer against which the compressed gas container when inserted is forced by the application of the cap to the body of the housing. The means mounted within the cap for co-operation with the gas container comprise in this construction an expandible and contractable clamp such as a pair of jaws pivoted together at one end and spring-connected at the other end to embrace the neck of the container. The cap also carries a spike or tubular slanted cutter or the like opposite the sealed mouth of the container so as to serve to break the seal when the container is released and is thrust forward by the spring means at its base or remote end.

The gas container is normally restrained from being driven against the seal breaking element by the above mentioned neck embracing jaws which are normally fastened together by a removable pin carried by the housing cap. The restraint exerted by the clamp jaws upon the container may comprise a conical bearing surface formed in the central opening of the clamp for engagement with a correspondingly coned cap on the neck of the gas container. By such a construction it will be understood that when the pin is withdrawn from the housing cap the clamp jaws are free to move apart under the restraint of their interconnecting spring, and the greater spring pressure at the base or far end of the gas container is able to drive the latter towards the cap and the seal breaking element thereof, the clamp jaws being meanwhile spread apart by the interaction of the above mentioned coned surfaces. The gas is thus released and able to pass rearwardly

between the exterior of the container and its housing to the exit hole in the latter.

In order to remove the discharged gas container, it is merely necessary to unscrew the housing cap. When a new container is put into position in the housing, the cap is again screwed on, the release pin having meanwhile been manipulated to re-fasten the jaws of the clamp which jaws close under the action of their inter-connecting spring.

The initial screwing action on the cap brings the above described coned surfaces into engagement, and the final screwing action drives the entire container against the spring or buffer at its remote end in the housing, thereby energising the said spring or buffer ready for the next occasion.

The releasing pin on the housing cap may be spring controlled and may work through a gland or packing so as to prevent leakage of the gas when released from the container.

In the case of a sealing disc in the mouth of the gas container the rupturing element may be a longitudinally fluted spike so that the gas can escape along the fluting even though the body of the spike remains in the

disc. The invention is not limited however to the use of gas containers sealed by a disc. It is for example applicable to containers sealed with a hollow copper plug in which case the fluted spike may be replaced by an appropriate plug breaking or bending element.

Instead of a spring controlled releasing pin in the cap of the housing the pin may be tapered and so disposed that a pull thereon forces the clamp jaws apart by a wedging action, in which case the jaw spreading action of the above described coned surfaces is unnecessary, and the coned surfaces may therefore take a simpler form.

Dated the 8th day of July, 1948.

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#### COMPLETE SPECIFICATION.

Improvements relating to means for Releasing Compressed Gas or Gases from Containers thereof.

We, THE WALTER KIDDE COMPANY LIMITED, a British Company, of Lux Works, Belvue Road, Northolt, Middlesex, and ALEXANDER RONALD SPIDY, a British Subject, of 34, Durham Avenue, Heston, Middlesex, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to means for releasing compressed gas or gases from containers thereof, and has particular reference to improved means for enabling compressed gas to be released into the interior of inflatable life-saving vests and similar buoyant devices with a minimum of effort and a high degree of efficiency and reliability.

The main object of the present invention is to provide improved gas releasing equipment in which use can be made of a form of compressed gas container at present available commercially, without in any way modifying such a container. Another object of the invention is to facilitate the replacement of a spent container, the act of replacement being such as to re-set the equipment for instant future use.

Accordingly the invention provides gas releasing equipment comprising a housing adapted for slidably accommodating a compressed gas container having a normally sealed mouth, a seal breaking device mounted in stationary relation to said housing, re-

silient means normally urging a gas container inserted in the housing to slide axially to bring the sealed container mouth into seal breaking contact with said seal breaking device, means normally restraining said container from movement under pressure of said resilient means toward the seal breaking device, and manually operable means for releasing the container movement restraining means, so that manual operation of said releasing means permits said resilient means to force the sealed container mouth into seal breaking contact with the seal breaking device, thereby releasing gas from the container.

In order that the invention may be clearly understood and readily carried into effect we will now describe the same with reference to the accompanying drawings, in which:—

Fig. 1 is a longitudinal sectional elevation of one embodiment of the improved gas releasing equipment;

Fig. 2 is a similar view of another embodiment slightly modified to permit of release of the gas by remote control means; and

Fig. 3 is a cross-sectional view on the line III—III of Fig. 2;

Fig. 4 is a representation of an airman carrying the equipment of Fig. 2.

Referring first to Fig. 1 the equipment there shown comprises a compressed gas container 1 slidably fitting into the body 2 of a housing having a cap 3 screw-threaded at 4 into the mouth of the housing. Inside the body 2 at the base thereof is a helical

spring 5 and seating plate 6 serving as a buffer against which the container 1 is forced by application of the cap 3 to the body 2. Mounted within the cap 3 for co-operation with the gas container 1 is an expandible and contractible clamp in the form of a pair of jaws 7 pivoted together at one end and spring-connected at their other or free ends by a helical tension spring 9. Identical clamp jaws are employed in the alternative embodiment hereinafter described with reference to Figs. 2 and 3. The cap also carries a spike 10 opposite the sealed mouth of the container so as to serve to break the seal when the container is released and is thrust forward by the spring means at its base or remote end. The jaws 7 are provided at one end with semi-cylindrical paired formations 7a, 7a which together constitute a hollow boss encircled by a retainer 8 to serve with the formations 7a, 7a as a hinge, a gap 7b being provided to allow the upper ends of jaws 7, 7 to separate, against the resistance of the spring 9. The hinged ends of the jaws 7 are supported by a pivot bolt 8a. The jaws 7 are also provided with semi-cylindrical formations 7c, 7c constituting a hollow boss which, when the jaws 7 are closed, is adapted to be embraced by an annular collar 11a forming part of a retractable sleeve 11.

The gas container is normally restrained from being driven against the seal breaking element 10 by the above-mentioned jaws 7 which are normally fastened together at their ends opposite the pivot 8a by the annular collar 11a of the retractable sleeve 11 carried by the housing cap and engaging the counterpart formations 7c, 7c on the jaws 7, 7 near their free ends. The restraint exerted by the clamp jaws, 7, 7 upon the container 1 may comprise, as shown, a concavely domed bearing surface 12 formed in the central opening of the clamp jaws 7, 7 for engagement with the rim on the front end of the neck of the gas container. By such a construction it will be understood that when the sleeve 11 is retracted the collar 11a frees the clamp jaws 7 to move apart, against restraint of their interconnecting spring 9, under the greater spring pressure at the base or far end of the gas container 1 which is able to drive the latter towards the cap 3 and its seal breaking element 11, the clamp jaws 7, 7 being meanwhile spread apart by the interaction of the container rim and the above-mentioned domed surface 12. The gas is thus released and able to pass rearwardly between the exterior of the container 1 and its housing body 2 to an exit hole 13 in the base.

In this construction the sleeve 11 is withdrawn from engagement with the counterpart formations 7c, 7c on the clamp jaws 7 by the airman's pull on a cord 14, which is attached at one end 14a to a spigot 11b

adapted to enter the hollow boss constituted by said jaw formations 7c, 7c and at the other end to a cover or hood piece 15 fitting over the cap 3.

As applied to an inflatable jacket or other buoyant device the equipment may be mounted in the wall thereof with substantially only the neck of the container and the housing cap projecting outwardly. When the airman pulls off the hood piece 15 and pulls the cord 14 sufficiently to retract the sleeve 11, the compressed air released by automatic puncture of the seal on the container escapes through the exit hole 13 as already described and inflates the jacket or other buoyant device. The sleeve 11 is held against rotation by the engagement with a peg 3a on a nipple 3b screwed into the cap 3 of a slot 11c in sleeve 11.

The alternative construction shown in Figs. 85 2 and 3 is in most respects similar to that shown in Fig. 1 but the retraction of the sleeve 11 is effected from a handle or grip 16 connected to the said sleeve by a pull-transmission member, such as a cable 17 marketed under the Registered Trade Mark BOWDEN. The released gas, instead of passing backwards over the external surface of the container to a hole in the base of the housing, passes by piping 18 to a terminal piece 19 secured hermetically to the wall of the inflatable device. In this way the equipment may be located in a convenient position whilst at the same time the release grip 16 may be also located conveniently as illustrated for example in Fig. 4.

In order to remove the discharged gas container, it is merely necessary to unscrew the housing cap. When a new container has been placed into position in the housing body, the cap is again screwed on, the jaws of the clamp close under the action of their interconnecting spring, and the collar 11a of sleeve 11 acting under the influence of a spring 20, re-fastens the jaw members together.

The initial screwing action on the cap 3 brings the above described domed surfaces 12 into engagement with container 1, and the final screwing action drives the entire container against the spring or buffer 5 at its remote end in the housing 2, thereby energising the said spring or buffer ready for the next occasion.

The releasing sleeve 11 in the housing cap may work through a gland or packing so as to prevent leakage of the gas when released from the container.

In the case of a sealing disc in the mouth of the gas container the rupturing element may be a longitudinally fluted spike so that the gas can escape along the fluting even though the body of the spike remains in the disc. Alternatively it may be a slant-ended tube having one or more side perforations as known in the art. The invention is not limited

however to the use of gas containers sealed by a disc. It is for example applicable to containers sealed with a hollow copper plug in which case the fluted spike may be replaced by an appropriate plug-breaking or bending element.

Instead of a spring-controlled releasing pin in the cap of the housing the pin may be tapered and so disposed that a pull thereon forces the clamp jaws apart by a wedging action, in which case the jaw-spreading action of the above described domed surfaces is unnecessary, and the domed surfaces may therefore take a simpler form.

15 What we claim is:—

1. A gas releasing equipment comprising a housing adapted for slidably accommodating a compressed gas container having a normally sealed mouth, a seal breaking device mounted in stationary relation to said housing, resilient means normally urging the gas container inserted in the housing to slide axially to bring the sealed container mouth into seal breaking contact with said seal breaking device, means normally restraining said container from movement under pressure of said resilient means toward the seal breaking device, and manually operable means for releasing the container movement restraining means, so that manual operation of said releasing means permits said resilient means to force the sealed container mouth into seal breaking contact with the seal breaking device, thereby releasing gas from the container.

2. A gas releasing equipment according to Claim 1, wherein the housing comprises a body portion and a removable cap portion, the gas container being readily insertable into and removable from said housing body portion, and the removable cap portion constituting a support for the seal breaking device, the container movement restraining means and the manually operable releasing means.

3. A gas releasing equipment according to Claim 1 or Claim 2 in which the means normally restraining sliding movement of the

gas container comprises a normally contracted device adapted for engagement with the mouth end of said container and consisting of a pair of expandible and contractible jaws normally held close by engagement of the releasing device, such as a collar or pin, with counterpart formations on said jaws.

4. A gas releasing equipment according to Claim 2 in which the housing cap portion when in position completely closes one end of the said housing, whilst the housing body portion is formed at its base with an opening through which the gas released from the container can escape after passing from the front of the unsealed container and between the latter and the interior surface of said housing body portion.

5. A gas releasing equipment according to Claim 1, 2 or 3, in which the housing is connectible to means for delivering the released gas at a remote point.

6. A gas releasing equipment according to Claim 5, wherein the means for releasing the container movement restraining means is adapted to be operated remotely by a flexible cable embodying an axially movable transmission core.

7. A gas releasing equipment according to any of the preceding Claims 1 to 4 inclusive in which the means for releasing the container movement restraining means is adapted to be operated by removal of a hood or cover detachably mounted on the housing.

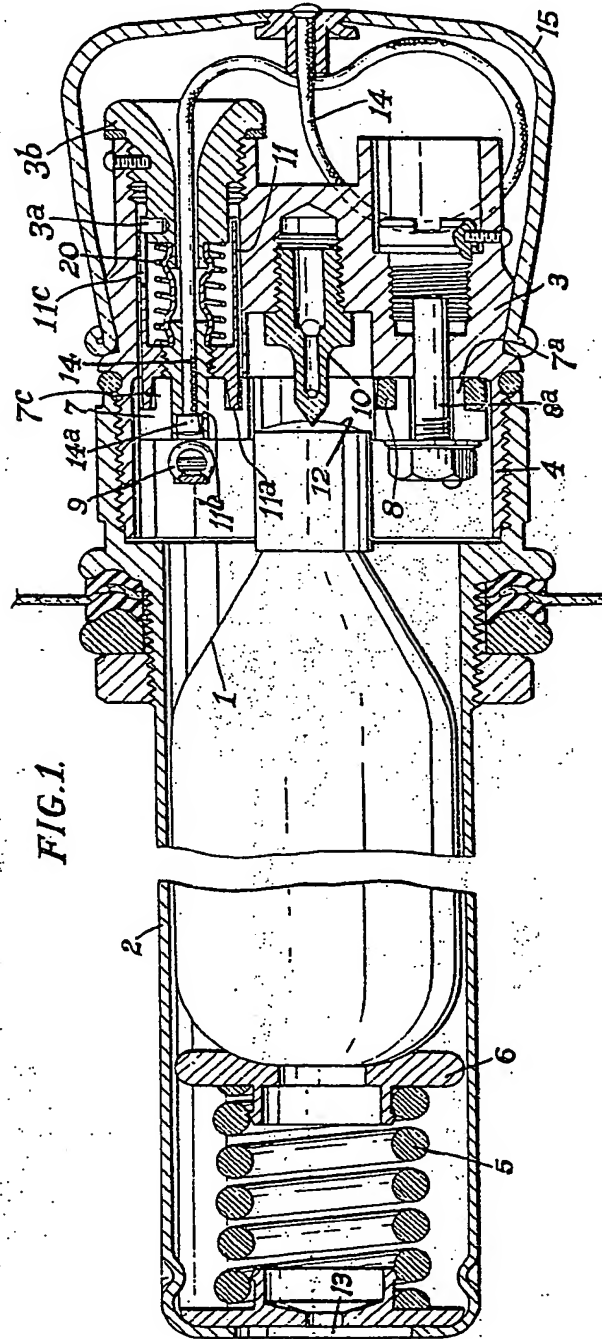
8. Gas releasing equipment substantially as hereinbefore described with reference to Figs. 1 and 3, or Figs. 2, 3 and 4 of the accompanying drawings.

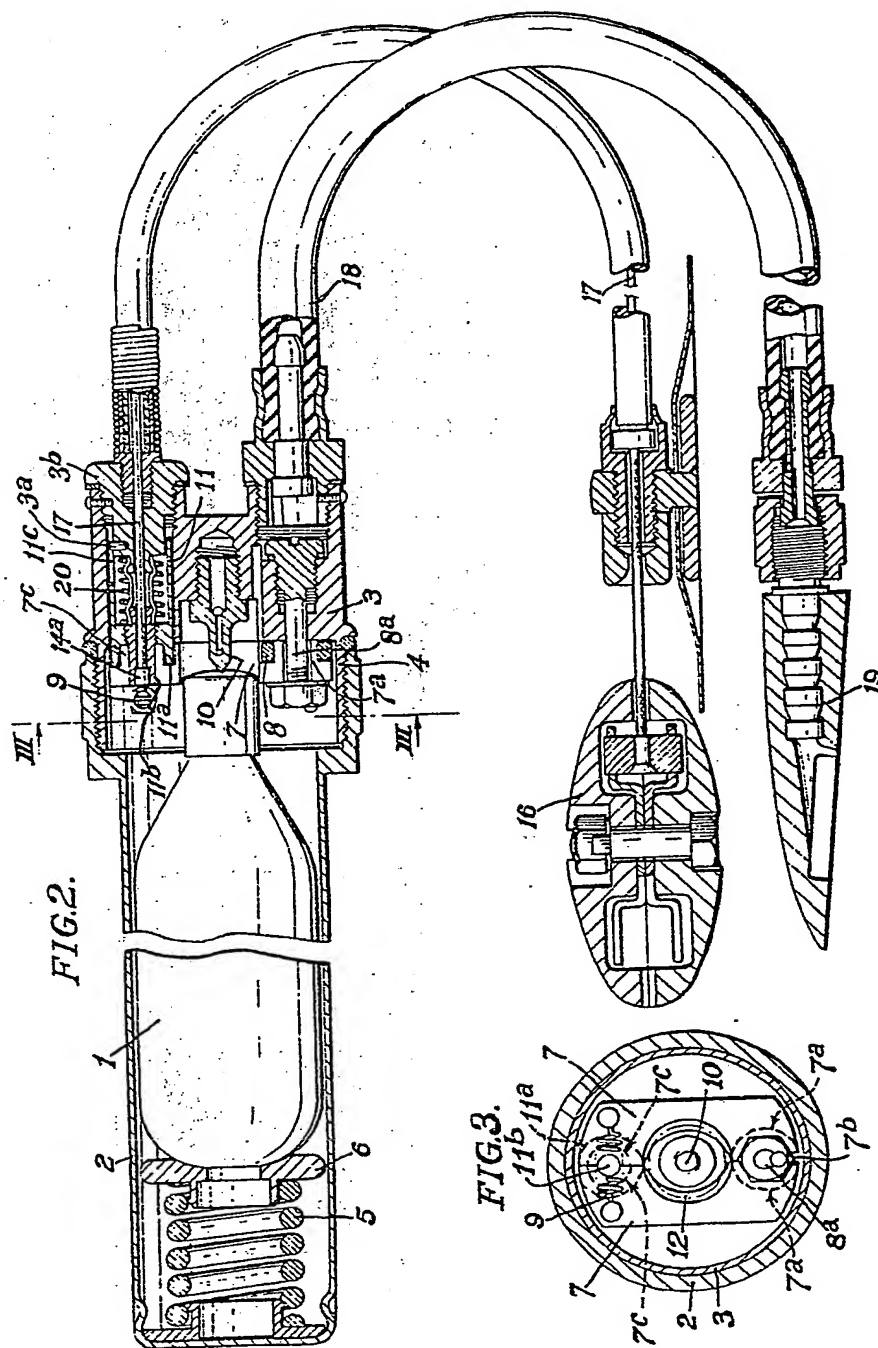
Dated the 8th day of July, 1949.

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*This Drawing is a reproduction of the Original on a reduced scale*





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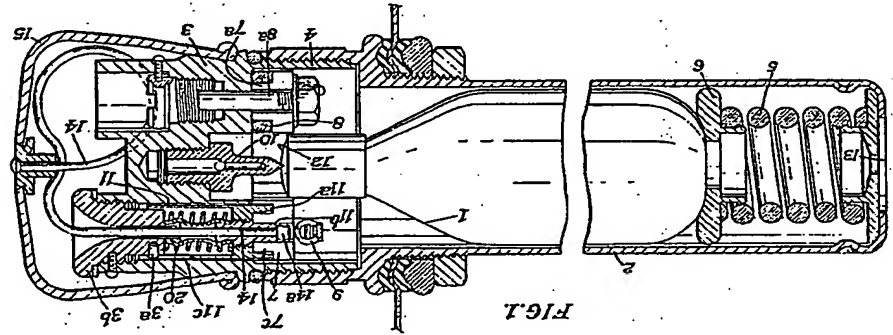


FIG. 1

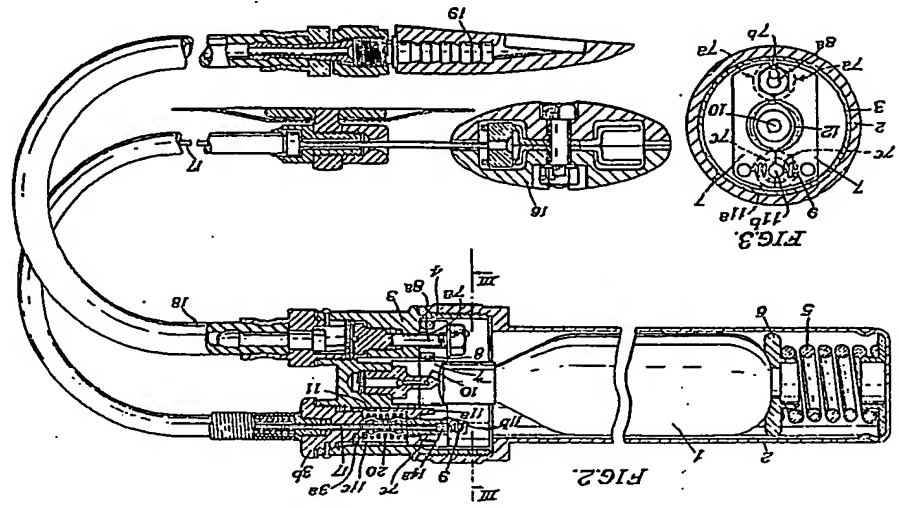


FIG. 2

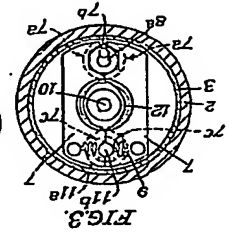


FIG. 3

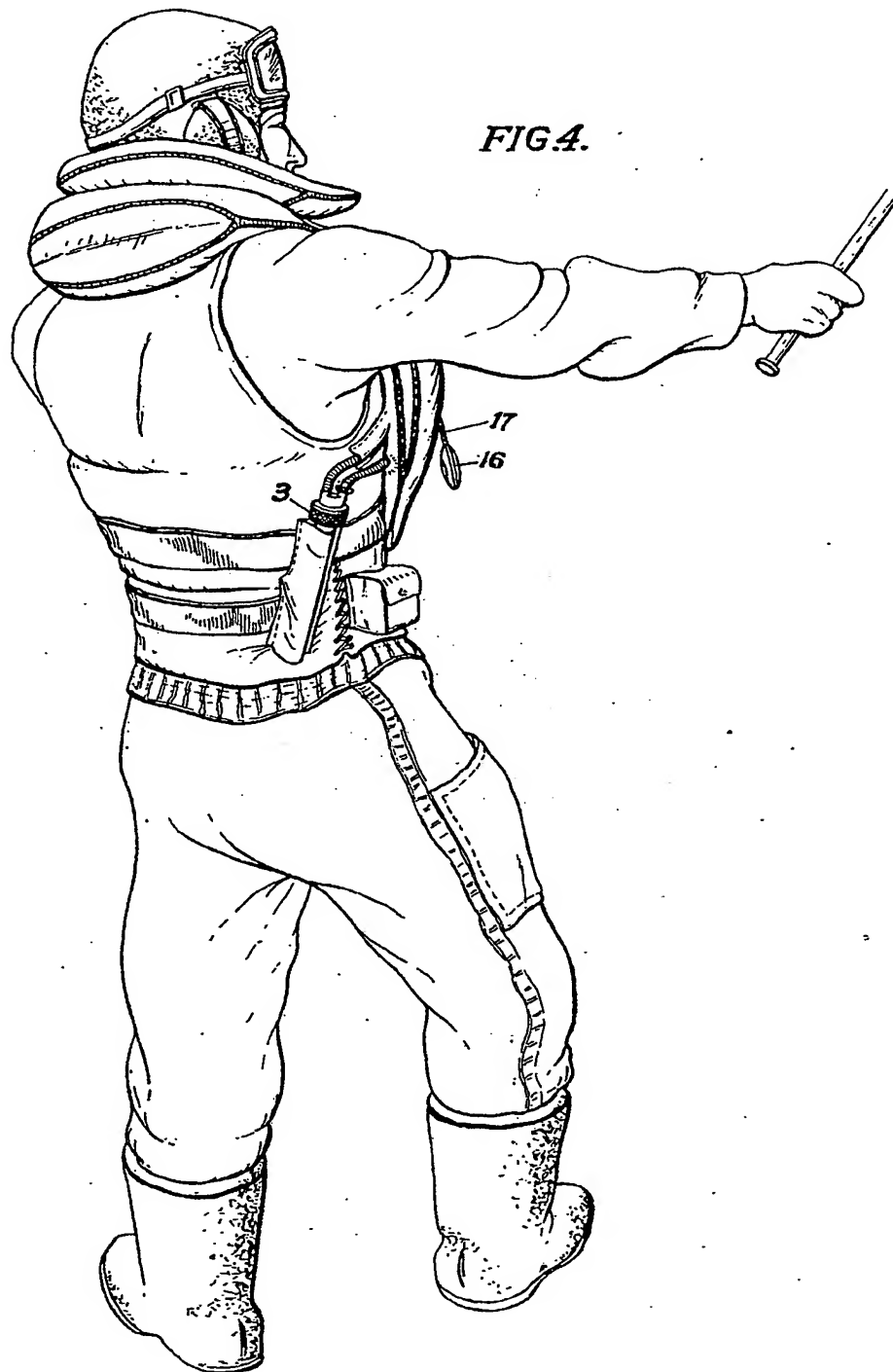
655503 COMPLETE SPECIFICATION

SHEET 1

3 SHEETS  
SHEET 2

H.M.S.O. (M.P.)

*This Drawing is a reproduction of the Original on a reduced scale*



H.M.S.O. (M.F.P.)